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Fear of negative evaluation, subject size of social network, and risk taking

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Fear of negative evaluation, subject size of social network, and risk taking

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Dedication

To my parents, Insang Kim and Jungnyo Suk,

and my wife, Heeyoung Park.

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Fear of negative evaluation, subject size of social network, and risk taking

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Previous research suggests that members of East Asian cultures show a greater risk preference in financial domains than do members of Western Cultures. Hsee and Weber (1998; 1999) suggest that this difference in risk preference is rooted in subjective size of social network (SSSN) cross cultures. There are some important limitations to this single variable model. I explored the role of SSSN and another candidate variable, fear of negative evaluation (FNE). Previous research suggests that individual differences in social variables (e.g., FNE or interdependence) may explain group differences in cognitive performances. I manipulated both FNE and SSSN in a group of college students and measured their risk preference and used a task that separately assessed the individual

relationships between the manipulated factors and the processes of risk taking. The results of Experiment indicate that both SSSN and FNE influence risk preference but in different ways. FNE influences perceived-risk, which in turn affects willingness to pay (WTP) and choice. In contrast, SSSN affects WTP and choice directly without being mediated by perceived risk. These findings clarify the previous work done by Hsee and Weber.

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Chapter 1

Introduction

There is much interest in cross-cultural studies of risk taking. A number of studies have focused specifically on financial risk taking. Research has shown that members of East Asian cultures are more risk-averse in most domains, such as social risk, than are those in Western cultures, but surprisingly are more risk-seeking than Westerners for financial risks (Hsee & Weber, 1999). Hsee and Weber (1999) suggested that the difference in risk preference is rooted in cultural differences in people's subjective size of social network (henceforth, SSSN). In this dissertation, I examine the determinants of this cross-cultural difference in risk-aversion more carefully. First, I briefly review the individual processes in risk taking and the existing explanations of the cross-cultural difference. Then, I discuss some important limitations of the previous work. I introduce a new variable, fear of negative evaluation (henceforth, FNE) that may contribute to the cultural difference. Then I examine my multi-variable model of cross-cultural differences in financial risk taking in Experiment, which includes SSSN and FNE.

Chapter 2

As discussed, previous research suggested that East Asians are less risk-averse than are Americans specifically for financial decisions and that the social network serves as a "cushion" that protects people if they take risks (Hsee & Weber, 1999). However, figuring out the relationship between a factor and risk taking is not a simple task. Some variables may directly influence risk perception itself and the others may be related to risk attitude or wiliness to pay (Mellers, Schwartz, & Cooke, 1998). For this reason, I must first examine the determinants of risk taking.

2.1 Components in risk taking: risk perception, attitude, and WTP

In risk preference, risk perception is a primitive and a risky choice depends on both the perceived riskiness and the value of a risky option (Markowitz, 1959). Specifically, people's willingness to pay (WTP) for risky option X is conceptualized as a compromise between the option's return or value (V) and its risk (R) and it is assumed that decision makers seek to minimize the risk for a given level of expected return:

$$WTP(X) = f(V(X), R(X)) = V(X) - bR((X) \qquad (1)$$

Traditional R-V models in finance equate V(X) with the expected value of option X and R(X) with its variance, a formalization that is compatible with a quadratic utility function for money (Levy & Markowitz, 1979), that is still widely used. Recent work (Bell, 1995; Jia & Dyer, 1996) has shown that a broad range of utility functions have risk-return interpretations. Different utility functions imply different measures of risk under the assumptions of risk aversion and the identification of the return with expected value. These

generalized risk-return models allow for the fact that the perception of the riskiness of risky options may differ between individuals or groups or may differ as a function of the decision context.

Equation 1 implies that individual or group differences in preference or willingness-to-pay for an option can come about in the two ways. They may result either from differences in the perception of the riskiness of option X (i.e., from differences in the value of R(X)) or from differences in the risk-value tradeoff (i.e., from differences in coefficient b), assuming that perceptions of the attractiveness or value of option X (V(X)) do not differ significantly between individuals or groups. (see Weber, Anderson, & Birnbaum, 1992 for empirical support for that assumption). Slovic (1964) made essentially the same theoretical distinction by describing two reasons for apparent differences in risk preference between two groups.

Risk preference is a label used to describe a person's choice when faced with two options that are equal in expected value but differ on a dimension assumed to affect the riskiness of options such as the variance (the difference between the high and low payoffs) of the outcomes. Options of the same expected value can differ in their variance of the outcomes. For example, an option A has a greater maximum gain and loss (e.g., probability of 0.65 for gaining $43 and 0.35 for losing $47) than the other option B (e.g. probability of 0.65 for gaining $36 and 0.35 for loosing $34). The option A has a greater difference between maximum gain and loss (i.e., higher variance) than does the option B but the two have the same expected value (i.e., $11.5).

Some people may choose a higher-variance option over a lower-variance option of equal expected value (i.e., behave as if they were risk-seeking) because they equate riskiness with variance and have a positive attitude towards risk; that is, they truly seek out the option perceived to be riskier. Other people who show the same choice pattern may choose the presumably riskier option because they have a different subjective impression

of the relative risks of the two choice options; for a variety of reasons (which may involve aspiration levels for returns) they may perceive the higher-variance option that they choose to be the less risky of the two options and therefore are, in fact, perceived-risk averse. Recently, empirical evidence has been provided for both of these processes. Weber and Milliman (1997) and Mellers, Schwartz, and Cooke (1998) show for a variety of decision domains (gambling, stock market, and commuting decisions) that within- and between-subject differences in apparent risk preference may either be the result of differences in attitude towards perceived risk (i.e., in the tradeoff coefficient b) or of differences in the way risk is perceived and defined (i.e., in R(X)).

Distinguishing between these two reasons for differences in apparent risk preference is important because each reason points to a different and distinct locus in the decision process at which individual or group differences come into play to influence risky choice. Each reason also corresponds to a distinct psychological mechanism that underlies observed differences in choice, preference, or willingness to pay. An understanding of the decision process and some knowledge about which component(s) of it may be affected by a decision maker's characteristics allow better prediction of people's reactions to changes in the situation or of their preferences in subsequent decisions.

Cooper, Woo, and Dunkelberg (1988) provide a concrete example for the utility of differentiating between group differences in risk perception versus group differences in perceived-risk attitude. Contrary to popular myths about the risk-taking propensity of entrepreneurs, they found that the factor that differentiated entrepreneurs from other managers was not a greater willingness to take on risks but, instead, an overly optimistic perception of the risks involved in risky choice options. For an outside observer who perceives risks more essentially, it therefore may appear that entrepreneurs have a greater propensity to engage in risky ventures. However, when differences in risk perception are factored out, entrepreneurs--just as other managers--have

demonstrated a preference for tasks in which the risks are only moderate (Brockhaus, 1982).

However, final manifestations (e.g., WTP and choice) of risk-seeking are influenced not only by these two factors but also by other contextual variables. For example, situational/contextual variables have been shown to influence WTP and choice but not risk perception (Sokolowska, in preparation; Sokolowska & Tyszka, 1995; Weber, Blais, & Betz, 2002).

In sum, variables influence risk taking in different ways. Some variables may be related to risk perception whereas others influence attitude. Some others may directly affect WTP without their influence on risk perception or attitude (Mellers et al., 1998).

2.2 Cushion hypothesis

According to Hsee and Weber's (1999) "cushion hypothesis", members of socially collectivist cultures (e.g., China), can afford to take greater financial risks because they perceive their social networks to be larger than do Westerners, and consequently because they are protected from catastrophic outcomes. The social network serves as a support that protects people if they take risks and fail. Although Hsee and Weber (1999) did not provide a clear definition of the size of social network, the social psychology literature defines social network as web of social relationships surrounding an individual (Syme & Berkman, 1976; Thoits, 1983a, 1983b). We can distinguish between the objective social network, which would be measured by actually counting the people connected to an individual and assessing their relationships to him or her, and a person's subjective size of social network, which is his/her perception and interpretation of the network (Barrera, 1986). A consensus among researchers is that the subjective size of social network consists mainly of the perceived number of members in the network (i.e., size itself) and

expectation of social/material/emotional supports from those people. The subjective and objective network sizes are weakly positively correlated with each other (Barrera, 1986; Furukawa, Harai, Hirai, Kitamura, & Takahashi, 1999).

The cushion hypothesis predicts that there will be more cross-cultural risk-preference differences for decisions involving monetary consequences than for decisions involving other outcomes, because East Asians' social networks provide more perceived support for financial problems than do the Westerners' social networks. To test this hypothesis, Hsee and Weber (1999) assessed Chinese and Americans' risk choices in three decision domains; financial, academic, and medical. The financial decision was about whether to invest money in a savings account or in stocks. The academic decision was about whether to write a term paper on a conservative topic so that the grade would be predictable or to write the paper on a provocative topic so that the grade could be either very high or very low. The medical decision concerned whether to take a pain reliever with a moderate but sure effectiveness or a pain reliever with a high variance in effectiveness. They found that the Chinese participants were significantly more risk-seeking than were the Americans only in the financial decision domain confirming the cushion hypothesis.

Further, Weber and Hsee suggested that such differences in financial risk taking were caused by the difference in WTP, which was assumed to be based on the difference in perceived risk between cultures (1998). They observed cultural differences in the pricing of risky options. They examined risk perceptions and attitudes towards perceived risk of respondents from China, US, Germany and Poland. In their study, Chinese respondents were significantly less risk-averse in their pricing than were Americans when risk preference was assessed in the traditional expected-utility framework. For example, Chinese participants offered significantly greater maximum buying prices for each option than did American participants. They suggested that

these apparent differences in risk preference were associated primarily with cultural differences in the perception of the risk of the financial options than with cultural differences in attitude towards perceived risk. In all cultures, the majority of respondents was willing to pay more for options perceived as less risky (i.e., they were perceived-risk averse) (Weber and Hsee, 1998).

In sum, according to the cushion hypothesis, the observed cross-cultural difference in financial risk taking is rooted in the difference in the perceiver risk caused by different sizes of social network between cultures. Figure 2.1 illustrates the influence of SSSN on risk preference.

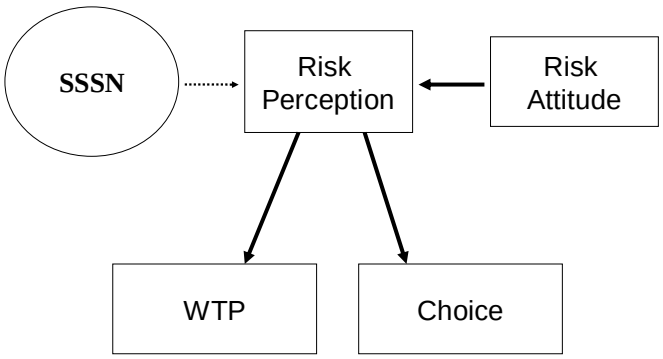

Figure 2.1: An overview of the cushion hypothesis of cross-cultural difference in financial risk preference.

2.3 Limitations of SSSN as a factor for the explanation of cultural/group differences in risk perception

As described, above, Weber and Hsee (1999; Weber & Hsee, 2000) interpreted their results as a support for their cushion hypothesis, suggesting that a larger SSSN in the Chinese population led to differences in risk perception between members of East Asian (e.g., Chinese) and Western (e.g.,

American) cultures. Although these observations are consistent with the cushion hypothesis, it is not clear whether the subjective size of social network directly influenced risk-perception producing a difference in risk-seeking between cultures. There are reasons to be cautions about deriving this conclusion.

First, there is an empirical gap between the observed cross-cultural differences in SSSN and risk perception. What Hsee and Weber found was that (a) Chinese were less risk-averse for the choices of riskier options in the financial domain than were Americans and (b) there was a positive relationship between SSSN and the choice judgments (Hsee & Weber, 1999). In another study, they found a difference in risk-perception and WTP (not in the attitudes towards perceived risk) between the two cultures (Weber & Hsee, 1998). Their studies never provided direct evidence for the link between SSSN and risk-perception, and these two observations alone are not sufficient to support the argument that SSSN causes differences in risk perception which then causes differences in risk preference. Further, if SSSN is a real causal variable, a difference in SSSN should reflect a difference in risk perception even within a single culture. Nonetheless, there have been few studies reporting a positive relationship within a culture.

Another important issue is that choice is relatively less sensitive to perceived risk than WTP, and variables that influence WTP and choice are quite different often leading to notable discrepancies between WTP and choice (Schkade & Johnson, 1989). Therefore, we do not have enough evidence for the argument that SSSN is responsible for the observed cross-cultural differences in risk perception. Rather, what Hsee and Weber found were individually observed cross-cultural differences in risk perception, WTP, and choice judgments, and the probable relationship between SSSN and overall risk preference.

Second, the notion of social network is poorly defined in the cushion hypothesis. There are many other ways of defining social network such as size (number of network members), density (extent to which members are connected to each other), boundedness (degree to which networks are defined on the basis of traditional group structures), or homogeneity (extent to which individuals are similar to each other; Syme & Berkman, 1976; Thoits, 1983a, 1983b). Existing evidence for the cushion hypothesis focuses on an extremely narrow piece of the broad characteristics of social network as a causal variable for the explanation of cross-cultural differences in risk preference. As discussed, in Hsee and Weber's (1999) study, among the questions on the scale for the measurement of SSSN, the only clearly observed difference between members of Chinese and American cultures was the number of people who could give each respondent financial help. The relevant question used in the study was "How many of those could you approach if you needed financial help or material support?" There were three other questions for the measurement of SSSN (e.g., number of friends or relatives and number of people who can provide psychological support). Hsee and Weber (1999) analyzed only the relationship between the number of people who can provide material support and financial risk-taking.

Third, it is unclear whether SSSN reflects a chronic cross-cultural difference as the cushion hypothesis suggests. In the studies of the cushion hypothesis, it is assumed that SSSN reflects differences between East Asian cultures, which are assumed to be collectivist, and Western cultures, which are assumed to individualist. Not surprisingly, different individuals can differ in SSSN. However, studies examining SSSN have demonstrated that SSSN is highly sensitive to current situations and contexts (e.g., current income and grade in school) rather than to variables that reflect chronic aspects of groups (e.g., gender) or cultures (Tanaka, Takai, Kohyama, Fujihara, & Minami, 1997).

In sum, the current model of the cushion hypothesis has limitations both in its explanation of the way SSSN influences risk preference and in its application of SSSN to cross-cultural difference. I wish to test the cushion hypothesis in a more comprehensive way. I begin by suggesting an alternative model. This model introduces another variable-fear of negative evaluation (FNE)-which has been demonstrated to differ between cultures. In the model, both FNE and SSSN influence risk preference but in a different way. In the Experiment, I test this model by manipulating SSSN and FNE and observing their influences on the individual processes in risk preference.

2.4 A multi-variable model of risk preference: FNE and SSSN

2.4.1 FNE as an individual difference variable and its influence on risk perception

I agree with Hsee and Weber that there are multiple independent processes (e.g., risk perception and attitudes towards perceived risk) that affect risk preference. However, I do not agree with their suggestion that cultural differences observed in the financial risk domain are mainly due to the differences in risk perception. Furthermore, I do not think that SSSN directly influences risk perception. Instead, I suggest that SSSN is related to other aspects of the manifestation of risk preference (e.g., attitude or WTP) and that there is another variable that explains the observed difference in risk perception.

Recent studies of aspiration level provide insight into how individual difference and situation variables influence risk preference. Aspiration level, as a kind of reference point, is defined as the expected return on a project. Studies of aspiration level suggest that people consider available options in

terms of their compatibility with aspirations, i.e., the goals, that they want to or must achieve (Lopes & Oden, 1998, 1999). A person's interpretation of his or her aspiration level seems to be related to WTP rather than to risk perception itself. That is risk perception is insensitive to changes in aspirations but risk preference is influenced by changes in aspiration level (Lopes and Oden, 1999). For example, Sokolowska (in preparation) found that a majority of participants made risk-averse choices when there was no conflict between minimizing risk and aspirations whereas, when the less risky option failed to meet the target return, they did not show clear risk aversion or risk-seeking.

Research on the impact of individual differences and situational factors on risk acceptance provides insight into how those variables independently influence risk perception or preference. Most recently, Weber, Blais, and Betz (2002) found that individual differences (e.g., sensation seeking, intolerance for ambiguity, gender) influenced risk taking by affecting perception of risk and benefits. However, they also found that situational factors (e.g., the content of the decision) influenced the tradeoff between risk and benefits, as suggested by the R-V approach. Sokolowska and Tyszka (1995) found that Poles expressed higher acceptance of technological and environmental hazards than did Swedes, even though Poles and Swedes trade off dangers and benefits differently, presumably because of differences in their economic situation, implying differences in wealth level and/or aspirations.

This approach is based on the idea that variables that can explain individual differences are directly related to risk-perception whereas situational variables are mainly related to interpretation of the tradeoff between risks and benefits (Sokolowska & Tyszka, 1995; Weber et al., 2002). An individual difference variable may be basic, fundamental, and culture-common, and should be able to cover variations both within a culture and between cultures. Another important reason that candidate variables must be defined specifically

is to provide more insight into the causal relationship between the variable and the observed differences within/between groups.

For example, Kim and Markman (2003; 2004) have proposed fear of isolation (FOI) as a candidate causal factor for the explanation of the observed cultural differences in other types of cognitive tasks in previous studies. They found that level of FOI has a positive relationship with the relative preference for dialectical reasoning (Kim & Markman, 2003) and the relative sensitivity to contextual vs. target information. FOI may affect risk preference by affecting risk perception rather than other processes in risk preference (e.g., attitude or WTP).

There are a number of reasons to believe FOI will affect risk perception. First, there is some noteworthy overlap between the dialectical reasoning mode and greater risk preference in East Asian cultures. Dialectical thinking is based on the philosophy of Holistic thinking. In the main body of the philosophy, there is an emphasis on change, a recognition of contradiction and the need for multiple perspectives, and a search for the "Middle Way" between opposing propositions. That is “the current worst does not necessarily have to be the future worst.” (Peng & Nisbett, 1999) Furthermore, this dialectical reasoning mode has been observed to make decision makers less likely to be sensitive to uncertainty (i.e., probability) producing a greater overconfidence and a more risk taking in uncertain (i.e., risky) situations in Asian cultures than in Western cultures (for further discussion, see Peng, 2001). In my previous research (Kim & Markman, 2004; Kim & Markman, 2003), higher levels of FOI were associated with a greater relative preference for dialectical reasoning within a single culture. Taken together, chronic level of FOI as a social anxiety variable reflects the relative preference for dialectical reasoning, which has more risk-seeking advices in its philosophy.

Nonetheless, more risk-seeking caused by a greater preference for the dialectical reasoning mode is not sufficient evidence for the relationship

between FOI and risk perception. A more direct support for the relationship comes from previous research suggesting that both cultural differences and differences in FOI can lead to differences in the relative sensitivity to context vs. target information (Kim & Markman, 2004; Masuda & Nisbett, 2001). This finding has a relationship with the previous studies demonstrating the relationship between loci of attention and risk perception (Lopes, 1984, 1987; Xie & Wang, 2003). As discussed, according to the risk-value (R-V) model, a risky choice depends on both the riskiness and the value of a risky option. Importantly, in the model, risk is treated as primitive (i.e., target) whereas the value is assumed to be related to contextual/situational information, e.g., aspiration level, (Lopes, 1984, 1987; Xie & Wang, 2003). Note that riskiness is related mainly to the possible loss and its probability whereas value of the risky option includes the amount of possible gain (Sokolowska & Pohorille, 2000). Obviously, any distribution of attention from the riskiness to the value should make a decision maker less sensitive to riskiness itself and, therefore, less risk-averse.

In this dissertation, I used fear of negative evaluation (FNE) as a more specific form of anxiety than FOI. This change from my previous work was made to strengthen the relationship between the manipulation and measurement. Fear of negative evaluation is consistent with (but a more specific construct than) FOI in that both of these factors represent a person's social concern and sensitivity to relationships with others. It is defined as apprehension about others' evaluations, distress over their negative evaluations, and the expectation that others would evaluate oneself negatively (Watson & Friend, 1969). Because there is no well-constructed measurement scale for FOI, previous studies have used the fear of negative evaluation scale as a measurement of FOI (e.g., Kim & Markman, 2003; 2004; Shoemaker, Breen, & Stamper, 2000). Thus, there is some question whether the observed differences in behavior were caused by manipulated FOI or only the influence

of the manipulation on FNE, which was measured on the scale. Admittedly, there are components of FOI other than fear of negative evaluation. In this study, FNE is manipulated and measured.

In sum, factors that causally explain differences in risk perception between different cultures should be basic and fundamental human traits and should reflect individual differences within a culture. They should be discriminated from one's interpretation of situation or context. FNE has some characteristics that make it a good candidate explanatory variable. I suggest that dialectical reasoning and relatively greater sensitivity to situational vs. target information primed by FNE influence risk perception. Nonetheless, it is unlikely that SSSN has no relationship with the observed differences in risk taking between cultures. Instead, I suggest that the locus in the causal chain in which SSSN influences risk-taking is not as the previous studies suggested. Instead, SSSN may be a situational factor. Then it may be related to attitudes towards perceived risk or directly to willingness to pay (WTP) or choice.

2.4.2 A multi-variable model of risk preference

I propose a model in which cultural differences in risk taking depend on both differences in risk perception and other processes (see Figure 2.2). As discussed, previous research explaining cross-cultural differences focused on the influence of a single variable (e.g., SSSN or interdependence vs. independence) on risk perception. It is unlikely that situational variables, which influence attitude or aspiration level, are homogeneous in level between cultures. On this view, SSSN influences risk-value tradeoff as an interpretation of situations rather than influencing risk perception itself. As discussed, FNE has been suggested as a causal variable that explains some observed differences between East Asian and Western cultures because of its influence on perception of context and relations among components (Kim and

Markman, 2003; 2004). I suggest that FNE directly influences risk perception, which then influences WTP and choice.

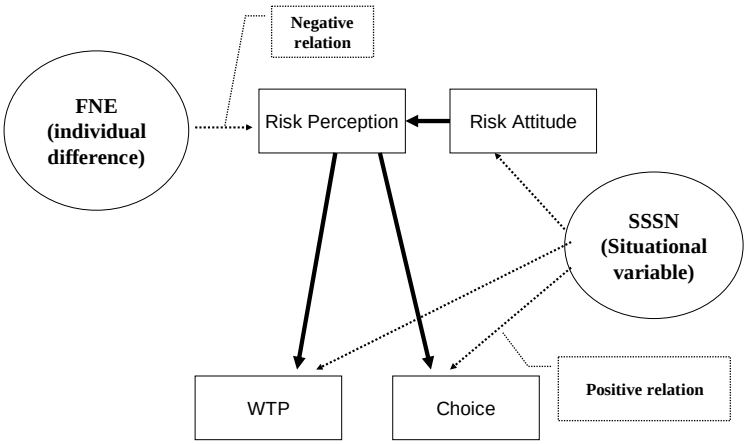

Figure 2.2: An overview of the proposed model of cross-cultural difference in financial risk preference

There are some important discrepancies between this model and Hsee and Weber's cushion hypothesis. First, according to the cushion hypothesis (Hsee & Weber, 1999; Weber & Hsee, 1998), greater risk preference in WTP and choice are rooted in a smaller perceived risk caused by a larger subjective size of social network, more specifically, one's expectation of financial support from the network. However, in my model, a greater risk preference is caused by an indirect influence of FNE though its direct effect on risk perception as well as direct influences of SSSN on WTP and choice. Second, the model suggests that there could be a difference in the ways in which SSSN influences WTP and choice. As discussed, dissociations between WTP and choice have frequently been observed in previous studies (e.g., Schkade & Johnson, 1989).

For example, one's aspiration level influences choice judgments with multiple options rather than WTP. This finding results because choice is relatively less sensitive to perceived risk than WTP, and variables that influence WTP and choice are quite different often making notable discrepancies between WTP and choice (e.g., Schkade & Johnson, 1989). However, studies of the cushion hypothesis have consistently found cross-cultural differences both in WTP and choice. As discussed, SSSN has a few important sub-components that are weakly correlated with each other such as network size and social support (Barrera, 1986). Therefore, if SSSN truly influences both WTP and choice, it is possible that multiple sub-components in SSSN are related to the observations. Indeed, SSSN is quite a broad variable, which includes various sub-components. Some of them may influence WTP whereas choice may be sensitive to others. This issue was not addressed in previous studies of the cushion hypothesis. In the present study, more sub-components in SSSN are measured and I examined their individual relationships to each aspect of risk preference.

Three pilot studies were performed first to demonstrate the influence of fear of negative evaluation and subjective size of social network by using the choice options from Hsee and Weber's (1999) study, in which participants were asked to choose between, for example, either of a sure gain or a risky option. In their study, each risky option had a chance of 50% to gain larger than the sure option and another chance of 50% to gain nothing. The loss domain was structured similarly. Within a culture, inducing a higher level of FNE both in American and Korean college students made them more risk-seeking in the Loss domain. In contrast, manipulation of SSSN showed a consistent effect in the Gain domain. However, there were no observed differences in risk preference and SSSN between participants of the two countries. These results suggest that SSSN may not be sufficient to explain the cross-cultural differences in risk preference. Further, the cushion hypothesis cannot explain

the observations, because the cushion hypothesis predicts an effect of SSSN regardless of the domain.

This domain difference is important because it may provide insight into the differences in the influence of FNE and SSSN on risk preference. The options used in the pilot studies and Hsee and Weber's (1999) study were pure gain and pure loss situations. As discussed, higher levels of FNE may decrease perceived risk in both domains and, consequently, may lead to greater risk preference in the loss domain. In contrast, in the gain domain, SSSN might be a stronger determinant of participants' judgments than risk perception, weakening the effect of FNE.

Previous research in risk acceptance supports this idea. Sokolowska and Pohorille (2000) suggest that risk is a linear combination of three basic dimensions of a risky situation: the amount of the loss, the probability of loss, and the amount of the gain. It is assumed that psychological transformations are made on these dimensions. According to the model of acceptance, risk acceptance is judged by making a trade-off between perceived risk and the amount of the gain. This idea can be applied to the current pilot studies. The pure loss domain (i.e., sure loss vs. gamble) is related to perceived risk rather than to amount of gain whereas the pure gain domain is related mainly to amount of the gain. That is, perceived risk was the main variable influencing participants' judgments in the loss domain in the pilot studies. As discussed, I assume that FNE is related to risk perception. And it was the case in pilot studies that High FNE group was more risk-seeking in the pure loss domain than was the Low FNE group.

In contrast, when choosing between a sure gain and a gamble in the pure gain domain, decision makers should be sensitive mainly to the amount of the gain (Sokolowska & Pohorille, 2000). In the pilot studies, the larger SSSN group was more likely to be risk-seeking for the larger gain than was the small SSSN group. Obviously, larger subjective size of social network is closely

related not only to greater expectation of social support but also to a larger desired size of outcome (i.e., expenditure). More importantly, note that SSSN was not a predictor of participants' judgments in the pure loss domain, in which perceived risk was the main factor. This analysis suggests that SSSN is related to other processes of risk preference rather than to risk perception.

In sum, the pilot study showed that both FNE and SSSN have positive influences on risk preference. More importantly, an implication from the results is that FNE influences risk perception whereas SSSN is related to other process in risk preference. As discussed, previous studies in risk taking suggest that variables that can explain individual differences are directly related to risk-perception whereas situational variables are mainly related to other processes in risk preference (Sokolowska & Tyszka, 1995; Weber et al., 2002). Taken together, I suggest that FNE, as an individual difference variable, influences risk perception whereas SSSN, as a situational factor, is responsible for the observed difference in overall risk preference in previous studies. If FNE influences perceived risk, it would then indirectly affect WTP and choice (see Equation 1).

The task used in the pilot studies cannot assess the potential mediating effect of risk perception, because it measured only risk preference without assessment of risk perception or attitudes towards perceived-risk. To address this question, in the Experiment, I decompose risk preference into component parts so that I measure quantitative indexes of the processes and assess individual influences of the two variables on them. To be clear, I am not proposing a general model of risk preference. There are a variety of factors that affect risk preference, including outcome feedback from previous risky decisions, aspiration levels, trust, expectations, and loss functions for outcomes that deviate from expectations (Slovic, 1977). Rather I suggest a specific causal mechanism for better understanding the observed differences in financial risk preference between East Asian and Western cultures and for providing a

model in which one of the fundamentally causal variables (e.g., FNE) operates with a contextual variable (e.g., SSSN) in risk preference.

In my study, I manipulate FNE and SSSN (including important sub-components), and measure individual processes in risk taking (i.e., perceived risk, attitude, WTP, and choice). There are two main predictions in this study. First, FNE influences risk perception and then indirectly affect risk preference. Second, SSSN directly influences risk preference but not risk perception.

Chapter 3

Experiment

Figure 2.2 summarizes the proposed relationships among FNE, SSSN, and risk preference. To test this idea, I explored the influences of FNE and SSSN on individual processes in risk preference. I manipulated both the levels of FNE and SSSN as independent variables. Then I created a more detailed set of stimuli varying outcome size (small vs. large), expected value, domain (gain/loss, gain, and loss), and probability of each option. As seen in Table 3.1, each option has two potential outcomes. For example, in the combined version of gain and loss (the top group of rows in Table 3.1), each option has one possible gain and one possible loss of money. And options vary on their outcome size. For example, the options A in the Small and Big outcome sizes in the Gain/Loss domain in Table 3.1 have the same probabilities of outcomes (0.65 for outcome 1 and 0.35 for outcome 2) differing in outcome size (e.g., $36 and $360 for outcome 1 in the Small and Big outcome sizes respectively) and, consequently, expected value ($11.5 vs. $115). The probabilities of obtaining each outcome are shown both graphically and numerically. The expected values and probabilities of individual options are shown in Table 3.1.

Table 3.1: Samples of risky game options in Experiment in terms of their outcomes (O1 and O2), probabilities (P1 and P2), expected values (EV).

Domain	Outcome Size	Type	O1	P1	O2	P2	EV
Gain/ Loss	Small	A	*$36*	*0.65*	*-$34*	*0.35*	*11.5*
		B	*$43*	*0.65*	*-$47*	*0.35*	*11.5*
		A	*$45*	*0.6*	*-$35*	*0.4*	*13*
		B	*$53*	*0.6*	*-$47*	*0.4*	*13*
	Big	A	*$360*	*0.65*	*-$340*	*0.35*	*115*
		B	*$430*	*0.65*	*-$470*	*0.35*	*115*
		A	*$450*	*0.6*	*-$350*	*0.4*	*130*
		B	*$530*	*0.6*	*-$470*	*0.4*	*130*
Gain	Small	A	*$36*	*0.65*	*$34*	*0.35*	*35.3*
		B	*$43*	*0.65*	*$21*	*0.35*	*35.3*
		A	*$45*	*0.6*	*$38*	*0.4*	*42.2*
		B	*$53*	*0.6*	*$26*	*0.4*	*42.2*
	Big	A	*$360*	*0.65*	*$340*	*0.35*	*353*
		B	*$430*	*0.65*	*$210*	*0.35*	*353*
		A	*$450*	*0.6*	*$380*	*0.4*	*422*
		B	*$530*	*0.6*	*$260*	*0.4*	*422*

Note 1. Option type A is less risky but smaller in outcome than Option B.
Note 2. Each domain has 16 options (i.e., 8 option pairs) in Experiment
Note 3. There are another 16 options for Loss version which are transformations into minuses of the 16 options of the Gain version (so the option types are reversed in each pair).

I asked participants to answer questions about their perceptions and reactions to the risky financial gamble options. From each participant's responses, five different indexes of risk preference were obtained, each of which reflects individual processes in risk preference: perceived risk, attitude towards perceived-risk, and WTP in Phase 1, and frequencies of choices of riskier option and choice reversals in Phase 2. Specifically, in Phase 1, participants were asked to rate perceived risk on a scale and to write their WTP on an open questionnaire. In addition to these two indexes, the index of

attitude towards perceived risk was calculated ($b_{R,}$ see Equation 2). For this, I followed the suggestion of the EV-subjective-risk model regressing WTP on the expected value of the option and on the perceived riskiness judgment provided by each respondent for each option:

$$WTP(X) = a + b_{EV}EV(X) + b_{R}R(X) \qquad (2)$$

This model is used to account for individual and cultural differences in the perception of the riskiness of the options (Bontempo, Bottom, & Weber, 1997; Weber & Hsee, 1998). I used the results of the regression analysis of each participant's WTP judgment on EV and perceived risk from the Equation 2 and calculated value of the regression coefficient for perceived risk (i.g., b_R).

In phase 2, I calculated the proportion of choices of the riskier option and the number of choice reversals. The same options used in the first phase were presented but I grouped the options into pairs as shown in Table 3.1. Each option in a pair had the same EV but the options differed in their rated riskiness and maximum values (i.e., variation). Within a pair, one option is treated as riskier than the other when it was given a higher rated riskiness in phase 1. In general, the option that had greater maximum gain and/or loss (e.g., probability of 0.65 for gaining $43 and 0.35 for losing $47) was judged as riskier than was the other option (e.g. probability of 0.65 for gaining $36 and 0.35 for loosing $34). There were few exceptions in participant's judgments.

For each pair, if a participant chose the option that was given a lower WTP in phase 1, it was counted as a choice reversal in phase 2. However, I don't expect WTP and choice responses be processed in entirely different ways in this study. Instead, I measured choice responses because analyses only with ratings of WTP are not sufficient to understand whether a factor influences attitude towards perceived risk or risk preference directly. The attitude index is calculated from the results of the regression analysis of each participant's WTP judgment on EV and perceived risk (Bontempo et al., 1997; Weber & Hsee, 1998). In this way, the two are interdependent. Some previous

research demonstrated that people are sensitive to direct comparison of options in choice tasks whereas rating or pricing is based on sequential judgment of each outcome within an option (e.g., Schkade & Johnson, 1989). Therefore, binary selection tasks such as choice among multiple alternative options provide an independent measurement of WTP when given multiple options, and, for that reason, have used in many aspiration level studies (Lopes & Oden, 1999; Sokolowska & Pohorille, 2000). Nonetheless, any discrepancy between WTP and choice judgments in this study can provide more insight into how FNE or SSSN influences risk preference in different ways. Both WTP and choice are parallel in that they are sensitive to contextual variables but they differ in the degree to which they are sensitive to perceived risk. For example, some contextual variables, e.g., aspiration level, make decision makers more insensitive to the perceived risk than do other contextual variables.

In sum, if either FNE or SSSN reflects individual differences in risk preference, then it would be reflected on the index of perceived risk. In contrast, if either of them is related to other processes rather than to risk perception itself, differences in the index either of attitude towards perceived-risk or WTP would be observed. Any difference in the number of choices of the riskier option and choice reversals would provide more insight into how variations of a candidate independent variable later influence decisions made by perceived risk. Further, independent measurements of individual processes in risk preference provide insight into how (and which) aspects of SSSN influence risk preference.

Of course, it is possible that the influences of FNE and SSSN are parallel. In particular, the more concerned a person is with evaluation, the more risk seeking he or she should be for losses, because accepting a sure loss is more likely to lead to social disapproval than is risking a possibility of no loss. For gains, people may want to look positive to their social network.

The larger their social network, the more pressure there will be to seek a potentially large gain.

To test this possibility of social conformity as a mediator, I assessed the degree to which people were concerned with accepting a loss and the degree to which they felt that risky gambles for gains were perceived as socially positive. To this end, a social conformity scale (SCS) was added (14 items) between the manipulations and the main task (Duckitt, Wagner, du Plessis, & Birum, 2002). Although SSSN (or FNE) and social conformity can overlap with each other to some extent, the two differ in that social conformity represents low deviance or antisocial attitudes and behaviors, which has been shown to be positively related to positive evaluation from society (e.g., Newcomb, 1997). If it turns out that people's risk preference in the gain and loss domains is mediated by values on SCS, then there would be a symmetry in the explanation of between FNE-risk preference (loss) and SSSN- risk preference (gain).

3.1 Manipulations and measurements of FNE and SSSN

3.1.1 FNE manipulation in clinical research

In my study, both FNE and SSSN were manipulated as independent variables. In clinical research, fear/anxiety of evaluation is manipulated by giving people a strong cue that they will be evaluated the near future. For example, Mansell and Clark (1999) induced participants' social anxiety by telling them they would be giving a speech about a controversial topic and that the speech would be evaluated. The technique of cue suggestion of speech technique has often been used as a way of inducing social anxiety (for further discussion, see Bandura, 1986).

There are other ways to induce social anxiety as well. For example, Bond and Omar (1990) induced participants' social anxiety by asking them to read given words loudly. Also, asking people to make a public speech was observed to have a similar effect to the cue suggestion technique (Behnke, Sawyer, & King, 1994).

These methods usually produce a significant amount of state anxiety or negative mood (Mansell & Clark, 1999). In general, people who are given a strong cue of evaluation in the near future have higher state anxiety than do those who were not given the cue.

In sum, traditional manipulations of social anxiety such as FNE in clinical research share some common procedures. First, as a prescreening participants' trait anxiety is measured (e.g., Winton, Clark, & Edelmann, 1995). For this reason, the FNE scale (Watson & Friend, 1969), which is assumed to measure individuals chronic FNE, has been often used for this purpose (e.g., Winton et al., 1995). Then, as discussed, social anxiety or evaluation fear is

induced by suggesting a cue that participants performances would be evaluated (Mansell & Clark, 1999) or by asking them to exhibit a public behavior (Behnke et al., 1994). Obviously these techniques focus on manipulating people's sensitivity to the current situation/task, thereby increasing state anxiety. For this reason, state anxiety measurements are used as a manipulation check and, then, the amount of increase/decrease is compared between the prescreened (e.g., high vs. low trait anxiety or experimental vs. control) groups.

3.1.2 FNE manipulation in Experiment

In my study, I did not use a manipulation like the techniques just described. The FNE scale was used for manipulation check rather than being used as a prescreening. The main purpose of the FNE manipulation in this study is to increase/decrease each individual's accessibility to their chronic FNE without creating differences in the levels of state anxiety or mood between them. Further, as discussed, the ultimate goal of this dissertation is to address the causal mechanism of the observed cross-cultural differences. It is unlikely that these differences are explained in terms of the differences in state anxiety between cultures. For this reason, I gave participants a self-description task, which is assumed to be related more to one's personal history than to current state. This method should activate the concept of FNE but should not produce significant differences in participants' levels of current anxiety or mood like the cue suggestion technique does. To insure these points, I measured both participants' FNE and state anxiety.

The High FNE group was asked to describe their own experiences of being embarrassed because they were negatively evaluated by others whereas those in the Low FNE group were asked to write their own experience of embarrassing someone by negatively evaluating them.

This study does not have a “no-manipulation” condition. Instead, the data are analyzed both for group differences between the levels of the independent variable as well as by examining relationships between the dependent variables and scores on the Fear of Negative Evaluation Scale. The two exposure tasks are designed to make the experimental treatments as homogeneous as possible except for the target variable of manipulation. It is inappropriate to directly compare the performance of the High and Low FNE groups to that of neutral (i.e., no manipulation) group, because the no-manipulation group has not thought at all about the concept of negative evaluation.

3.1.3 Manipulation of SSSN

For the manipulation of SSSN, it was assumed that the difficulty in listing network member influences the perception of the size of social network (i.e., subjective size of social network). Participants in the Large SSSN condition were given background information that most of people, in average, can quickly list “three” closest friends when asked whereas those in the Small SSSN condition were told that “most of people, in average, can quickly list “twenty” closest friends when asked”. The pilot studies revealed that it is difficult to list twenty friends in a minute (on average, participants listed about 11). As discussed, it was assumed that the relatively greater difficulty in listing friends in the Small SSSN condition produces a smaller subjective size of social network. Both groups were asked to list as many friends possible in a minute, so the effect of the manipulation is on people’s perception of the size of their social network, not on the actual number of friends listed. It is obviously, if any, an opposite direction of effect to our purpose of the manipulation. In this manipulation, for example, the number of people listed in the Large SSSN condition could have an about the same deviation from the

given reference point (i.e., 3) with the number in the Small SSSN condition from the given reference point (i.e., 20).

In sum, in the Experiment, a 2 × 2 design that FNE (High vs. Low) and SSSN (Large vs. Small) were manipulated between subjects. I used the Fear of Negative Evaluation scale as a measure of FNE, (Watson & Friend, 1969) (for details, see Appendix 1). To measure SSSN, each participant was given a set of nine questions; the size of the network, i.e., the number of network members, (Network Size), its density, i.e., the extent to which members are connected to each other (Density), its boundedness (Boundedness: the degree to which networks are defined on the basis of traditional group structures), its homogeneity (Homogeneity: extent to which individuals are similar to each other), the expectation of financial support from the network (Financial Support), and the expectation of the emotional support from the network (Emotional Support) on a scale from 1 to 10 (see Appendix 2). These items are a collection of the main dimensions in previous research measuring size of social network (e.g., Biegel, Magaziner, & Baum, 1991; Chou, 1999; Moorer & Suurmeijer, 2001).

3.2 Method

Design

The experiment used a 2 (FNE: High vs. Low) × 2 (SSSN: Large vs. Small) × 3 (domain: Gain/Loss, Pure Gain, and Pure Loss) × 2 (outcome size: Large and Small) design. FNE and SSSN were manipulated between subjects. Domain and outcome size were within subjects. The main dependent variables were perceived risk, risk attitude, WTP and choice.

Participants

170 American undergraduate students at the University of Texas at Austin were given course credit for their participations in the study. 2 participants whose native language was not English were excluded from the analyses in Experiment. To ensure the validity of the FNE manipulation, a coding scheme was created for analyzing participants' self-descriptions in the High and Low FNE conditions. Participants' responses were coded on whether they 1) described their being embarrassed because themselves were negatively evaluated by others; or 2) described their experience of embarrassing others by negatively evaluating them. Obviously, participants in the High and Low conditions should respond in terms of the former and the latter coding schemes respectively. Two coders examined participants' self-descriptions (intercoder reliability = .91) and 9 participants who did not follow this scheme or did not give any relevant description were not included in the analyses. As a result, 159 participants were included in the analyses.

As described above, the High FNE group was asked to describe there own experiences of being embarrassed because they were negatively evaluated by others whereas those in the Low FNE group were asked to write their own experience of embarrassing someone by negatively evaluating them. Participants in the two SSSN conditions were asked to list as many friends possible but the two groups were given different background information (i.e., 3 vs. 20).

After the manipulations, all participants responded to the Fear of Negative Evaluation scale and the question set for SSSN as manipulation checks. Participants were then given the social conformity scale (SCS) and PANAS (Positive and Negative Affect Schedule) for the measurement of positive/negative mood. 20 items of the PANAS were used to test whether observed differences in risk preference between FNE and/or SSSN conditions

are mediated by a difference in the level of positive/negative mood. This scale measures participants' positive affect and negative affect (Watson, Clark, & Tellegen, 1988). Positive Affect reflects the extent to which a person feels enthusiastic, active, and alert. In contrast, Negative Affect is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, fear, and nervousness. The two mood factors have emerged as highly distinctive orthogonal dimensions in factor analytic studies of affect (Watson et al., 1988).

Questionnaires and procedure

After the manipulations of FNE and SSSN, the manipulation checks, and the measurements of social conformity and mood, participants answered questions about their perceptions and reactions to financially risky gambles. As described, each gamble had two potential outcomes. For example, in the combined version of gain and loss (Gain/Loss), each option had one possible gain and one possible loss of money. The probabilities of obtaining each outcome were shown both graphically and numerically. The expected values and probabilities of individual options are shown in Table 3.1.

In the phase 1, participants saw each of the 48 options. They were told to assume that they were gambling. They were instructed to examine each gamble separately, to consider the possible losses and gains, and to answer the following questions: "How risky do you think this investment option is?" and "what is the maximum amount you would be willing to pay to get a chance at this gamble (if you would not buy it at any price, say $0.)" Perceived riskiness of the option is expressed on a numerical rating scale that ranged from 0 (not at all risky) to 10 (extremely risky). From the two indexes, the index of the attitude towards perceived risk for each option was calculated.

In phase 2, participants were asked to choose one from a pair of options. The same gambles used in the first phase were presented. Each gamble pair has the same EV but vary in their rated riskiness and maximum values.

3.3 Results

3.3.1 Manipulation checks and the analyses of SC and PANAS

First, I checked the effectiveness of the FNE manipulation and the SSSN induction with participants' scores on the FNE scale and the SSSN question set. Tables 3.2 and 3.3 show the average scores on the FNE scale and the SSSN question set, and planned t-tests for them between conditions respectively. As shown in the Tables, average values on the Fear of Negative Evaluation scale were significantly higher in the High FNE conditions than in the Low FNE conditions. Average values on the Fear of Negative Evaluation scale were significantly higher in the High FNE condition ($\underline{M}$ = 17.20) than in the Low FNE condition ($\underline{M}$ = 13.43), $\underline{t}$ (157) = 3.56, $p < .01$. There was no significant difference in FNE between the Large SSSN condition ($\underline{M}$ = 15.02) and the Small SSSN condition ($\underline{M}$ = 15.58), $\underline{t}$ (157) = .50, $p = .613$. Further analyses indicated that the two FNE groups significantly differed in eight items of the FNE scale (in call cases, $p < .01$). There were also three items that showed the corresponding difference at .05 level (for details, see Appendix 1).

Table 3.2: Illustrations of manipulation checks of FNE and SSSN, and descriptions of participants' responses on SCS and PANAS.

Conditions / Measurement		High FNE – Large SSSN	High FNE – Small SSSN	Low FNE – Large SSSN	Low FNE – Small SSSN
FNE Scale		16.93	17.49	13.13	13.73
SSSN	SSSN	47.05	40.44	44.73	40.20
	Network Size	4.51	3.74	4.23	3.54
	Density	5.80	5.67	5.40	4.75
	Homogeneity	6.58	5.13	5.50	5.63
	Boundedness	6.90	5.54	6.53	6.08
	Financial Support	4.01	4.31	4.95	4.08
	Emotional Support	5.70	4.85	5.43	5.38
PANAS	Positive affect	26.90	28.77	26.73	27.33
	Negative affect	15.08	15.15	16.10	15.03
SCS		33.45	33.77	32.38	33.85

Note 1: All values are average scores for each condition.

To explore each participant's SSSN, I took the sum of the nine judgments participants made. A reliability analysis indicated that the nine judgments were consistent enough to be summed into one index (Cronbach's alpha = .66). There was no significant correlation between the FOI manipulation and SSSN induction indicating that the two did not have systematic influence on each other. FNE had a significant correlation neither with any sub-component in SSSN or the single index. Further, because there was no significant interaction of any measured variables between the two manipulations (in all cases, $p > .3$), I compared responses in terms either of the two FNE groups or two SSSN groups in subsequent analyses.

Table 3.3: Planned t-tests for FNE, components in SSSN, PANAS, and SCS between FNE conditions and between SSSN conditions.

		High vs. Low FNE groups	Large vs. Small SSSN groups
FNE		17.20 vs. 13.25 **	15.02 vs. 15.58
SSSN	Network Size	4.13 vs. 3.88	4.37 vs. 3.63 **
	Density	5.73 vs. 5.08	5.60 vs. 5.20
	Homogeneity	5.86 vs. 5. 56	6.04 vs. 5.38
	Boundedness	6.22 vs. 6.30	6.71 vs. 5.81 *
	Financial Support	4.15 vs. 4.57	4.47 vs. 4.19
	Emotional Support	5.28 vs. 5.40	5.56 vs. 5.11
PANAS	Positive affect	27.82 vs. 27.03	26.81 vs. 28.03
	Negative affect	15.11 vs. 15.56	15.58 vs. 15.09
SCS		34. 11 vs. 33. 12	33. 41 vs. 33.81

Note 1: All values are average scores for each condition.
Note 2: * and ** indicate a significance at 0.05 level and 0.01 level respectively.

Participants in the Large SSSN group (45.89) gave higher judgments to the SSSN question set than did those in the Small SSSN group (40.31), $\underline{t}$ (157) = 2.84, $p < .01$. There was no significant difference in SSSN between the High FNE ($\underline{M}$ = 43.78) and the Low FNE conditions ($\underline{M}$ = 42.46), $\underline{t}$ (157) = .66, p =.512. Tables 3.2 and 3.3 show average scores of the individual components in the SSSN question set and planned t-tests for them between the two SSSN conditions respectively. It indicated that the SSSN manipulation influenced mainly Network Size and Boundedness though the Large SSSN group showed higher average scores in all components than did the Small SSSN group.

Further analyses indicated that Financial Support acts differently than do the other factors of SSSN. The other five components were significantly (and positively) correlated with each other (in all cases, $r > .2$, $\underline{p} < .01$).

However, Financial Support was correlated only with Network Size ($r = .24$, $p < .01$) and Emotional support ($r = .36$, $p < .01$). Although a factor analysis did not provided a clear dimensional distinction between the six factors of SSSN, these results may be consistent with previous studies suggesting that SSSN consists mainly of the number of members of the network (i.e., size itself) and expectation of social/material/emotional supports from the network but the two are weakly correlated with each other (Barrera, 1986; Furukawa et al., 1999).

The groups did not differ in the overall levels of positive and negative mood. Planned t-tests indicated that there were no significant differences in the scores on the two affect scales among the SSSN and FNE conditions nor was there interaction (in all cases, $p > .25$). These findings rule out the possibility that mood was systematically confounded with FNE or SSSN. And there was no difference in social conformity between FNE or SSSN conditions. A two-way ANOVA of FNE and SSSN did not produce any significant difference in social conformity or interaction between the conditions (in all cases, $P > .3$).[1]

Most importantly, for eleven questions on the FNE scale, including the collapsed scale score, there were significant differences between the two FNE groups. However, the two groups did not differ in their state anxiety or mood. Taken together, these results indicated that the FNE manipulation affected participants' accessibility to their chronic FNE without creating differences in the levels of state anxiety or mood between them.

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[1] Social conformity had significant relationships with a few sub-components in SSSN. The correlations of conformity with Boundedness ($r = .23$, $p < .01$) and Network Size ($r = .18$, $p < .05$) were significant. However there was no significant relationship between social conformity and any of the individual processes in risk preference. Further analyses indicated that social conformity did not have any indirect influence on the individual processes in risk preference (in all cases, $p > .3$). Therefore, I did not take social conformity into further analyses.

3.3.2 Influences of FNE and SSSN on risk preference

Next, I analyzed risk preference judgment. The data are shown in Table 3.4. A four-way ANOVA of FNE × SSSN × domain × outcome size revealed a significant main effects of domain and outcome size in perceived risk, WTP and the two indexes of choice responses (in all cases, $p < .05$) reflecting, for example, relatively higher perceived risk for options of the larger outcome size in loss domain for those of the lower outcome size in other domains. These effects are not germane to the aim of this study and, further, there was no significant interaction of these variables with the two manipulations (in all cases, $p > .3$). Therefore, I will not discuss them further in following analyses.

Table 3.4: Illustrations of risk preference in the FNE and SSSN conditions.

Risk preference	High FNE – Large SSSN	High FNE – Small SSSN	Low FNE – Large SSSN	Low FNE – Small SSSN
Perceived risk (M)	5.22	5.15	5.69	5.70
Risk attitude (M)	-1.41	-1.42	-1.38	-1.40
WTP (M)	67.7 (1.30)	68.8 (1.23)	64.8 (1.22)	60.9 (1.21)
Choices of the riskier options	9.95	8.00	8.25	6.73
Choice reversals	4.48	4.28	4.5	3.61

Note 1. The numbers in parentheses in WTP are indexes transformed to a logarithmic scale.

Perceived risk

I analyzed each participant's mean judgment of perceived risk. There was no significant three-way interaction of FNE, SSSN, and domain, $F (1, 155) = .04$, $p = .843$. A reliability analysis indicated that the three judgments were consistent enough to be summed into one index (Cronbach's alpha = .64).

Average perceived risk was significantly lower in the High FNE condition (M = 5.18) than in the Low FNE condition (M = 5.69), t (157) = 2.70, p < .01. To further examine the effect of FNE, an ANCOVA that included the Fear of Negative Evaluation scale score as a covariate was performed. If level of FNE influenced participants' risk perception, then the difference between FNE groups should decrease when the scale values are added as a covariate. Consistent with this logic, the effect of the Fear of Negative Evaluation scale score was significant, F (1, 156) = 17.08, p < .01, and the condition effect was reduced to non-significance, F (1, 156) = 2.55, p = .119. As expected, the relationship between FNE and risk perception was significantly negative (r = -.35, p < .05). These results indicate that levels of FOI decrease the degree of perceived risk. A Sobel (1982) test indicated that FNE, as a mediator, was indeed responsible for the difference in perceived risk between the two FNE conditions (Sobel Test = -2.66, p <.01). In contrast, none of the sub-components in SSSN including the collapsed single index had a significant correlation with participants' perceived risk.

WTP

Table 3.4 shows the overall WTP in the FEN and SSSN conditions. There was no interaction in overall WTP between FNE and SSSN manipulations, F (1, 155) = .37, p = .545, nor was there a significant three-way interaction of the two manipulations and domain, F (1, 155) = .38, p = .536. A reliability analysis indicated that the three judgments were consistent enough to be summed into one index (Cronbach's alpha = .65).

Then we compared the average of the WTP for each participant in the Large SSSN (or High FNE) condition to that in the Small SSSN (or Low FNE) group. There were no significant differences in WTP between the Large SSSN condition (M = 66.4) and the Small SSSN condition (M = 64.3), t (157) = .47, p =.642, nor between the High FNE group (M = 65.8) and the Low FNE

group ($\underline{M}$ = 65.4), t (1, 157) = .84, p = .405. However, a correlation analysis indicated that WTP had a significantly positive correlation with one's expectation of financial support (Financial Support), which was one of the measured components in SSSN (r = .29, p< .05). Neither FNE nor any other aspect of SSSN showed a significantly positive relationship with WTP. Note that the SSSN manipulation in this dissertation influenced mainly one's perceived number of network member (Network Size) rather than Financial Support. These together, the current results indicate that a person's WTP for risky options is systematically influenced by one's expectation of financial support from network members. Further, as discussed, FNE may have an indirect influence on WTP despite its lack of a direct influence. I will address these points later using structure equation modeling.

Risk attitude

For the index of attitude towards perceived risk ($b_{R,}$ see Equation 2), I followed the suggestion of the EV-subjective-risk model, and regressed WTP on the expected value of the option and on the perceived riskiness judgment provided by each respondent for each option (Weber & Hsee, 1998):

$$WTP(X) = a + b_{EV}EV(X) + b_{R}R(X) \qquad (2)$$

This model allows for individual differences in the perception of the riskiness of the options (Bontempo et al., 1997; Weber & Hsee, 1998). This model was fit to each participant's 48 WTP judgments. The model accounted for an average of 41% of the variance in WTP across participants, with a range from 13% to 99%. None of the regression coefficients of the model were significantly different as a function of FNE or SSSN group.[2] Further, analyses of scatter plots indicated that the coefficient *b* was linear in range tested.

[2] As Hsee and Weber (1998) addressed, multicollinearity should not be a concern for the model (Equation 2). Another model considered in their study was, P(X) = a +

I used the results of the regression analysis of each participant's WTP judgment on EV and perceived risk from the Equation 2 and calculated the value of the regression coefficient for perceived risk (i.e., b_R). The analyses indicated that no factors included in this study had a reliable influence on attitude towards perceived risk.

There were no significant differences in the index of risk attitude between the Large SSSN condition (M = -1.40) and the Small SSSN condition (M = -1.41), t (157) = .08, p =.937, nor between the High FNE group (M = -1.42) and the Low FNE group (M = -1.40), t (1, 157) = .82, p = .411. Neither FNE nor any individual sub-components in SSSN showed a significant relationship with risk attitude index. These results are consistent with Weber and Hsee's study (1999), in which they did not observe cross-cultural difference in risk attitude. In sum, the results indicated that FNE and SSSN were not related to risk attitude.

Choice of riskier options

As described, I calculated two indexes from each participant's choice responses in phase 2: (a) choices of the riskier option and (b) choice reversals. To measure each participant's choices of the riskier option, I counted the number of times each participant selected the riskier option for each option pair. Then I calculated a single index of choices of the riskier option based on the percentage score of the counted number for the total choices (i.e., 24 choices) for each participant such that, for example, a participant's score of 33 indicates 33% of his/her choices was of the riskier options.

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*b*EVEV(X) + *b*RVAR(X), which VAR represents the objective difference between two possible outcomes of an option. The multicollinearity (between EV and VAR) was observed only when this model was considered both in their and my studies.

The Large SSSN group (M = 37.9) chose the riskier options significantly more often than did the Small SSSN group (M = 30.6), t (157) = 2.80, p < .01. There was a marginally significant difference in the index between the High FNE condition (M = 35.8) and the Low FNE condition (M = 32.7), t (157) = 1.70, p =.091. However, correlation analyses indicated that the choice of riskier option had a significant positive relationship with Network Size in SSSN (r = .41, p < .01) but not with FNE. No other aspects of SSSN showed a significant relationship with the index.

To further explore the relationship between the Network Size and the choice of riskier option, an ANCOVA was performed, which included Network Size as a covariate. If the size of network influenced participants' risk perception, then the difference between the two SSSN groups should decrease when participants' ratings for their Network Size are added as a covariate. Consistent with the logic, the effect of the Network Size was significant, F (1, 156) = 25.89, p < .01, and the condition effect was reduced to marginal significance, F (1, 156) = 3.46, p = .07. A Sobel (1982) test indicated that Network Size, as a mediator, was indeed responsible for the difference in choice of riskier option between the two SSSN conditions (Sobel Test = 3.43, p <.01). In sum, the results indicated that one's choice of riskier option was systematically influenced by his/her Network Size.

Choice reversal

I was also interested in factor that would lead to preference reversals. Choice reversals were defined as the choice of the riskier option in phase 2 even when the riskier option was given less WTP in Phase 1. To measure each participant's choice reversals, I counted the number of times each participant selected the option that was given a lower WTP in the first phase. As I did for the riskier option, I calculated an index of choice reversals based on the percentage of the 24 option pairs that led to choice reversals.

Participants in the Large SSSN group (M = 18.7) made more choice reversals than did those in the Small SSSN (M = 16.5) group but the difference was not significant, t (157) = 1.29, p =.198. This difference may reflect the significant but weak correlation between Network Size and the index of choice reversals (r = .17, p < .05). No other factors showed significant correlation with the choice reversal index. Although there was no effect of outcome size, when the outcomes were larger the effect of Network Size was observed to be stronger than when they were small. This finding suggests that participants in the Large SSSN group (M = 19.6) showed marginally more choice reversals than did those in the Small SSSN (M = 16.0) group, t (157) = 1.86, p =.064. The correlation between the Network Size and choice reversal in the Big outcome size was positively significant (r = .27 p < .05).

The results in this section indicate that people who had a larger SSSN were more risk taking when choosing one between two alternative options with the same expected value, and that Network Size is the factor most responsible for these observations.

Risk perception, WTP, and choice

I also analyzed the relationships among perceived risk, WTP, and choices of riskier option in each domain. Table 3.5 illustrates the individual correlations between perceived risk, WTP and choice of riskier option in the Gain/Loss, Gain, and Loss domains. As shown in Table 3.5, perceived risk has a significant negative relationship with WTP in all domains. Perceived risk had significantly negative (but overall lower than its relationship with WTP) relationships only with risky choices in Gain/Loss, and Gain domains. The correlation between perceived risk and choice in the Gain domain was not significant indicating that only Network Size was responsible for the observed differences between the groups in that domain. As discussed in introduction, aspiration level or expectation of expenditure, which is probably related to the

Network Size, might strongly constrain participant's choice judgments in this domain. In sum, WTP is influenced mainly by perceived risk whereas choice may be affected by other variables beyond perceived risk.

Those relationships are important because, first, the analyses of the relationships between WTP and choice provide insight into how/why these two measures often differ (e.g., Schkade & Johnson, 1989), and second, the positive relationships between perceived risk and WTP/Choice are the routes through which FNE indirectly influences risk preference in general as well as its direct influence on risk perception.

Of particular interest, these results explain why inducing a higher level of FNE made participants more risk-seeking in the Loss domain whereas manipulating SSSN showed a consistent effect in the Gain domain across cultures in the pilot studies. In pilot studies, experimentally increased FNE probably decreased perceived risk both in the Gain and Loss domains but the decreased perceived risk might not influence risk-taking in the Gain domain.

Table 3.5: Individual correlations between perceived risk, WTP and choices of riskier option in Gain/Loss, Gain, and Loss domains.

	Domain			
	Overall	Gain/Loss	Gain	Loss
PR- WTP	-.31**	-.20*	-.28**	-.28**
PR – Choice	-.17	-.20**	.08	-.19*
WTP - Choice	.07	.13	-.07	.02

Note 1: PR, WTP, and Choice represent perceived risk, willingness to pay, and choice of riskier option respectively.
Note 2: * and ** indicate a significance at 0.05 level and 0.01 level respectively.

In sum, the results indicate that the participants followed the risk-value (R-V) model, which leads to the negative relationship between perceived risk and risk preference. Specifically, there were negative relationships of

perceived risk to choice in the Gain/Loss and Loss domains, and to WTP in all domains.

Nonetheless, as shown in Table 3.5**,** there were discrepancies between WTP and choice within each participant in this study. The correlations between the two types of risk-taking in the three domains were not neither significant nor strong. As discussed, WTP was influenced by Financial Support whereas Network Size was responsible for the explanations of differences in choice. Taken together, the current results suggest that any exclusive increase in either of the two factors in SSSN could produce an inconsistency between WTP and choice. But WTP and choice were assumed to reflect the same influence of a culture on risk-taking in the studies of the cushion hypothesis (Hsee & Weber, 1999; Weber & Hsee, 1998).

In sum, analyses of individual correlations between perceived risk, WTP, and choice indicated that both WTP and choice were mediated by perceived risk (except in the Gain domain for choices). These results raise the question of whether FNE, which was observed to systematically decrease perceived risk, could have indirect influences on WTP and choice through the perceived risk, even though FNE does not have direct relationships to WTP and choice. In my model, multiple factors influence risk taking in different ways. A good way to explain these findings may be to interpret the observations in terms of direct and indirect relationships between variables (Alwin & Hauser, 1975; Bryman & Cramer, 1990). Structural equation modeling provides a good test of indirect path when there is no direct relationship between an independent variable and a dependent variable. I demonstrated this issue by examining indirect paths from FNE to WTP or choice through perceived risk as well as direct paths from Financial Support and Network Size to WTP and choice respectively.

Model evaluation: SEM tests

To clarify, the purpose of the SEM tests in this dissertation is not to evaluate all individual relationships between the (many) factors but rather to confirm the indirect influences of FNE on WTP and choice. For this reason, I adopted two simplified models (one for WTP and the other for choice) at the expense of specific illustrations of the relationships between FNE and SSSN and individual processes in risk preference. The two structural equation models explain indirect and direct paths from FNE and SSSN to WTP and choice respectively. Further, these two models illustrate the two different ways that these factors influence risk preference.

To demonstrate the direct and indirect paths of factors to risk-taking, structural equation modeling techniques were conducted with SPSS AMOS 4.0. Initially, several alternative models were tested in addition to the hypothesized models but the each of the two hypothesized model below had the best fit. The two models were constructed with directional paths from a predictor (i.e., Financial Support or Network Size) in SSSN and indirect paths from FNE through perceived risk to WTP or choice of riskier option respectively. Following Jaccard and Wan's guideline, (1996, p. 130), model fits were evaluated with four goodness-of-fit indices in addition to chi-square fit: the adjusted goodness-of-fit index (AGFI, Bollen, 1989), the comparative fit index (CFI, Hu & Bentler, 1998), the Tucker–Lewis index (TLI, Tucker & Lewis, 1973), and the root-mean-square error of approximation (RMSEA, Steiger, 1990). Figure 3.1 shows the relevant models with path coefficients, and Table 3.6 presents the estimate, standard error, and test statistic *t* for each structural path in the models for WTP and choice respectively.

The SEM model for WTP supported the idea that FNE indirectly influences WTP whereas Financial Support has a direct influence on WTP. The model demonstrated: (a) FNE is negatively linked to perceived risk; (b)

perceived risk is negatively linked to WTP; and (3) Financial Support is positively linked to WTP. Figure 3.1a displays the hypothesized relations among variables. (Residual variables are omitted for the sake of clarity) All hypothesized pathways in the model were significant (see WTP in Table 3.6). Especially, the estimates for the relationships between FNE and WTP suggested that the higher one's FNE the less his/her perceived risk. That lower perceived risk leads to greater WTP.

In addition to the chi-square fit, $\chi^2(22, N = 159) = 33.24$, $p < .05$, the four fit indices consistently indicate good model fits for this model (overall model: AGFI = .921, CFI = .936, TLI = .919, RMSEA = .057), indicating that the model is acceptable. In sum, the model indicates that FNE has an indirect influence on WTP.

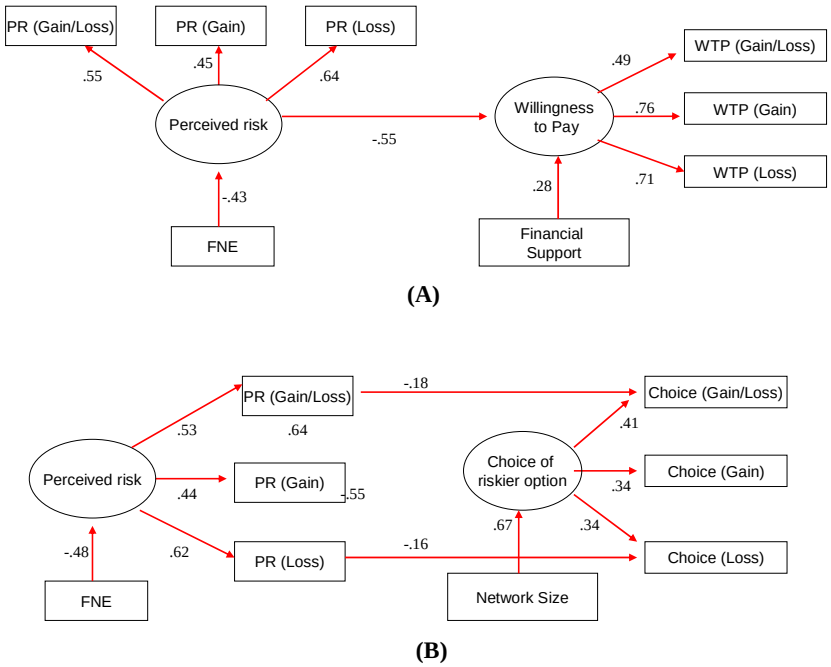

Figure 3.1: Structural equation models for WTP (A) and choice of riskier option (B) with significant coefficients at 0.05 level.

In the model for choice of riskier options, the best model was created by separating the relationships between perceived risk and choice by domains. In this model, FNE has an indirect influence on choice through its influence on perceived risk only in Gain/Loss and Loss domains, indicating that the indirect influence of FNE on choice depends on domain. In the Gain domain, participants' choice judgments were explained only by Network Size. All hypothesized pathways in the overall model were significant (see Choice in Table 3.6). But the four fit indices provide somewhat inconsistent model fits for this model (overall model: AGFI = .888, CFI = .795, TLI = .726, RMSEA = .085). According to chi-square fit, $\chi^2(20, N = 159) = 47.45$, $p < .01$, and AGFI, this model is acceptable but, strictly on statistical grounds, the model should be rejected because the values of the other three indices are not acceptable enough. However, the patterns of the significant coefficients indicate that FNE has an indirect positive relationship with choice while Network Size directly increases choice of riskier option.

Table 3.6: Standard Estimates, Standard Errors, and Test Statistics (t) for pathways between measures in WTP and Choice.

	Willingness to Pay		
Outcome and pathways	Estimate	*SE*	t[a]
FNE → Perceived risk	-.058	.013	-4.484
Perceived risk → WTP	-2.746	.589	-4.665
Financial support → WTP	.509	.154	3.309
	Choice		
FNE → Perceived risk	-.063	.013	-4.861
Perceived risk → Choice (Gain/Loss domain)	-.192	.081	-2.355
Perceived risk → Choice (Gain domain)	-.246	.116	-2.126
Financial support → Choice	.293	.056	5.186

[a] t >.20 or t < .-2.0 indicates statistical significance (p < .05).

Chapter 4

Conclusions and discussion

4.1 Summary of the results

This study demonstrated that FNE and SSSN influence risk preference in different ways. The observed patterns and analyses of the relationships between independent variables (FNE and SSSN) and processes (perceived risk, WTP and choice) in risk preference were consistent with the predictions of the model in this dissertation. Participants in the High FNE group exhibited relatively lower perceived risk than did those in the Low FNE group whereas no factors of SSSN had a significant correlation with participants' perceived risk. When Fear of Negative Evaluation scale values were incorporated into the analyses as a covariate, they were significantly related to the degree of perceived risk, and the strength of the effect of FNE manipulation was decreased.

In contrast, the results indicated that people who had a larger SSSN were more risk-seeking in WTP and choice but the two were observed to differ in their related factors. Specifically, people's WTP for risky options was systematically influenced by their expectation of financial support from network members whereas Network Size was observed to be responsible for the observed difference in choices of riskier option and choice reversals.

Analyses of individual correlations between perceived risk, WTP and choice and structural equation modeling indicated that both WTP and choice

were mediated by perceived risk except in the Gain domain for choices. These results suggest that FNE, which was observed to systematically decrease perceived risk, has indirect influences on WTP and choice through perceived risk, even though FNE does not have a direct relationship to these outcome measures.

In sum, the results of Experiment indicate that FNE influences perceived-risk, which in turn affects willingness to pay and choice whereas SSSN directly affects WTP and choice without being mediated by perceived risk. These findings demonstrate that both SSSN and FNE influence risk preference but in different ways, clarifying the previous work done by Hsee and Weber and supporting the current model in this dissertation for the explanation of cross-cultural differences in risk preference in previous studies.

4.2 Implications for the cushion hypothesis

The current study replicated the cushion hypothesis by showing that the two factors of SSSN were observed to influence risk preference. It suggests that, if there is a difference in either (or both) of these factors between cultures or groups, then we can predict some relevant difference in risk preference. It is consistent with the prediction of cushion hypothesis. Further, this study elaborates the cushion hypothesis by identifying multiple sub-components in SSSN, each of which explains a specific influence of SSSN to individual processes on risk preference, and by showing how SSSN influences them.

Nonetheless, there are some important discrepancies between this model and Hsee and Weber's cushion hypothesis. First, as discussed, according to the cushion hypothesis (Hsee & Weber, 1999; Weber & Hsee, 1998), greater risk preferences in WTP and choice are rooted in a less perceived risk caused by a larger subjective size of social network, more specifically, one's greater expectation of financial support from the network. However, in the current

study, a greater risk preference was caused by an indirect influence of FNE through its direct effects of risk perception on WTP and choice as well as direct influences of sub-components in SSSN on WTP and choice. This issue is particularly important because even the cushion hypothesis assumes that a factor influences risk perception should be treated as the main causal variable for the explanation of cross-cultural difference or group difference (Weber & Hsee, 1998). Further, as discussed above, SSSN was observed to influence WTP and choice in different ways in this study. Indeed, SSSN is a broad variable, which includes various sub-components. This issue was not addressed in the studies of cushion hypothesis.

To be clear, I am not proposing a general model of risk preference. There are a variety of general factors that affect risk preference, including outcome feedback from previous risky decisions, aspiration levels, trust, expectations, and loss functions for outcomes that deviate from expectations (Slovic, 1977). Instead, I suggest a specific causal mechanism for better understanding the observed differences in financial risk preference between East Asian and Western cultures. This dissertation focuses on the relationship between FNE, which has been demonstrated to be sensitive chronic aspects between cultures, and risk-taking and elaboration of SSSN in explaining cross-cultural differences in risk preference.

Nonetheless, there may be a difference in generalizability between the cushion hypothesis and my model. The cushion hypothesis, which dealt with SSSN, predicts (and observes) cross-cultural difference only for the financial domain. For example, Hsee and Weber (1999) found a cross-cultural difference in risk preference in the financial domain between Chinese and American participants but not in other domains such as medical and academic situations. But research has shown opposite directions of cross-cultural differences in various domains between the two (i.e., East Asian and Western) cultures. For example, East Asians have been observed to be more sensitive to

social risk than are members of Western cultures (Weber, Hsee, & Sokolowska, 1998). Indeed, it is unlikely that behaviors in domains other than financial risk are not related to risk perception. Importantly, according to both the cushion hypothesis and my model, at least one candidate factor should explain the variation in risk perception between cultures or individuals for the explanation of cross-cultural/group differences in risk preference. The results of the current study indicated that SSSN has a relationship only to (monetary) WTP and choice whereas FNE has a direct influence on risk perception. Thus, my model has further potentiality as a general causal model of risk preference for the explanation of cross-cultural differences in risk perception in other domains. If so, future research should address how the relationship between FNE and risk perception differ between domains.

4.3 Implications for cross-cultural research

I suggest that FNE influences risk preference as a factor, which reflects individual and cultural differences, whereas SSSN is sensitive to situations and contexts rather than reflecting chronic aspects of individuals or cultures. On this view, cross-cultural differences should be understood in terms of the considerations of both chronic and situational aspects of a culture (Oyserman, Coon, & Kemmelmeier, 2002). Studies examining SSSN have demonstrated that SSSN is highly sensitive to current situations and contexts (e.g., current income and grade in school) rather than to variables that reflect chronic aspects of groups (e.g., gender) or cultures (Tanaka et al., 1997). However, members in East Asian and Western cultures have been consistently observed to differ in their chronic levels of social anxiety e.g., interdependent self-construal and FNE, (Kim & Markman, in preparation; Okazaki, 1997; Okazaki, Liu, Longworth, & Minn, 2002).

Taken together, these observations help resolve the inconsistency between the results of my pilot studies and those of studies in the cushion hypothesis. In my pilot studies there was no significant difference in any factors of SSSN between Korean and American participants whereas FNE was higher in Korean participants in American participants. But previous studies of the cushion hypothesis often found differences in SSSN *only* between Chinese and Americans (e.g., Hsee & Weber, 1999). Few studies, however, observed a consistently larger SSSN across East Asian countries. The inconsistency, therefore, indicates that SSSN is sensitive to the current situational/contextual aspects in societies rather than reflecting a common chronic aspect of a culture. However, for example, FNE and interdependent self-construal have been observed to be consistently higher in the collectivist culture, which includes all East Asian countries, than in individualist culture.

Further, previous studies in risk preference suggest that individual differences are directly related to risk perception whereas situational variables are mainly related to one's interpretation of the target return from the given option or the tradeoff between risks and benefits (Sokolowska & Tyszka, 1995; Weber et al., 2002). Likewise, in this study, FNE was observed to be related to risk perception whereas SSSN directly influenced WTP and choice.

The current study has some implications for studies in cross-cultural difference in judgment and decision making in general. Most behavioral research has focused on the individual relationship between a variable and a process of risk preference. This approach itself is contributable to the descriptions of cross-cultural differences. However, we should be careful in applying the individually observed patterns and relationships between variables to the explanation of causal mechanism of the observations. Without this work, we often misleadingly locate a factor on the causal chain and interpret observations in terms of the causally irrelevant but eventually related factor. This study demonstrates that SSSN is the case in previous studies.

4.4 Limitations and future research

The relationships between SSSN and both WTP and choice are harder to explain. Two different relationships SSSN with WTP and choice were observed in this study but I do not have theoretically sufficient explanations for these observations. Furthermore, to my knowledge, this dissertation is the first demonstration of the individual relationships that sub-factors of SSSN have on different processes in risk taking in cross-cultural research. More theoretically/empirically comprehensive examinations of the relationships should follow this dissertation.

Participants in the Large SSSN group made more choice reversals than did those in the Small SSSN group but the difference was not significant. One reason for the small effect of Network Size in choice reversals may be the overall low frequency of choice reversals. Looking at 3.1, it is possible that the option pairs in this study did not have enough difference in maximum values between options. Another potential reason for the marginal significance may be that the manipulation of SSSN was not specific enough to create choice reversals. For example, recent studies of aspiration level (e.g., Sokolowska, in preparation) specifically primed a target return by presenting a clear aspiration level but there was no explicit priming in this study. This point should be addressed in future studies.

An important issue should be addressed from the results of the pilot studies is the applicability of the translated scales and cognitive tasks used in this study, including those in the pilot studies, and Hsee and Weber's (1999) studies. As discussed, in pilot studies, levels of FNE and SSSN were positively correlated with the degree of risk preference in the Gain and Loss domains respectively within each culture. However, Koreans did not show a significantly larger risk preference even though their scores on the FNE scale were much higher than were those of American participants. There was no

systematic influences of translations or currency between US Dollar ($) and Korean Won (₩) in Korean data. Otherwise there would be consistently higher or lower risk preferences across domains or outcome sizes in Korean than in American participants but they were not the cases in the pilot studies. This inconsistency suggests that the materials used in the current study (like many other cross-cultural studies in J/DM research) have some limitation in being directly applied to cross-cultural comparisons. This issue is beyond the scope of the current dissertation research proposal. My aim is to understand cross-cultural difference in risk preference not through a direct comparison of risk-taking between cultures but through different patterns in risk-taking caused by manipulations of variables of interest within a culture. However, future research should focus on the development of materials that can be used reliably across cultures.

Another important issue is a further examination of the relationship between FNE and risk perception. As discussed, the significant negative influence of FNE on perceived risk observed in this study was assumed to be due to the relationship between FNE and dialectical reasoning or sensitivity to context. Nonetheless, direct assesses of the relationships were not included into this dissertation. Future study should address this point.

Also, a scale that measures fear of negative evaluation should be further developed. In this study, FNE scale was used as a manipulation check because it was assumed that the FNE manipulation influenced participants' accessibility to their chronic FNE without making differences in their level of state anxiety or mood. We found that eleven items in the scale were sensitive to the FNE manipulation. Therefore, it would be interesting to know whether the eleven items were truly sensitive only to individuals' perceived FNE. This issue is important because a consensus among researchers is that the FNE scale measures people's trait sensitivity to negative evaluation rather than rather than their current state. This assumption is consistent with the belief that one's fear

of negative evaluation is a trait rather than state. State variables can be easily influenced by a simple change in context or manipulation but traits should resistant to manipulation. Thus, there is some question whether FNE scale is appropriate to be used as a manipulation check. Ultimately, this issue could be addressed by developing a new scale that truly reflects only one's sensitivity to chronic FNE caused by the FNE manipulation in this study. For this purpose, a further examination of the items, which were observed to be sensitive to the FNE manipulation in this study should be carried out.

Finally, it is important to bear in mind that we induced significant differences in risk perception based on a simple manipulation of a participant's level of fear of negative evaluation. As these findings demonstrate, a straightforward change in motivational state can lead to a large difference in basic cognitive functioning. This work highlights the need to include more research on the influence of motivation on cognitive processing within the canon of research in Cognitive Science.

Appendices

Appendix 1. Fear of Negative Evaluation Scale

For the following statements, please answer each in terms of whether it is true or false for you. Circle “T” for true or “F” for false.

	High FNE	Low FNE
I rarely worry about seeming foolish to others. R	44	61
I worry about what people will think of me even when I know it doesn’t' make any difference.**	63	36
I become tense and jittery if I know someone is sizing me up.**	60	33
I am unconcerned even if I know people are forming an unfavorable impression of me. R	15	25
I feel very upset when I commit some social error.	64	63
The opinions that important people have of me cause me little concern. R	19	16
I am often afraid that I may look ridiculous or make a fool of myself.**	60	28
I react very little when other people disapprove of me. R	27	31
I am frequently afraid of other people noticing my shortcomings.*	45	27
The disapproval of others would have little effect on me. R	34	31
If someone is evaluating me I tend to expect the worst.	30	26
I rarely worry about what kind of impression I am making on someone.** R	18	43
I am afraid that others will not approve of me.*	44	26
I am afraid that people will find fault with me.	50	27
Other people's opinions of me do not bother me. R	18	22
I am not necessarily upset if I do not please someone. R	72	80
When I am talking to someone, I worry about what they may be thinking about me.	52	38
I feel that you can't help making social errors sometimes, so why worry about it. R	56	55
I am usually worried about what kind of impression I make.**	65	38
I worry a lot about what my superiors think of me.	68	67
If I know someone is judging me, it has little effect on me. R	21	30
I worry that others will think I am not worthwhile.	31	30
I worry very little about what others may think of me.	32	23
Sometimes I think I am too concerned with what other people think of me.**	62	37
I often worry that I will say or do the wrong things.**	56	30
I am often indifferent to the opinions others have of me.* R	36	56
I am usually confident that others will have a favorable impression of me. R	77	83
I often worry that people who are important to me won't think very much of me.	35	30
I brood about the opinions my friends have about me. R	34	23
I become tense and jittery if I know I am being judged by my superiors.**	72	37

Note 1. * and ** indicate a significant difference at .05 level and .01 level respectively.
Note 2. The numbers on the right two columns indicate proportion of the “true” response” for each question.
Note 3. R indicates a reversed item.

Appendix 2. Question set for the measurement of SSSN

How many close friends do you have (people that you feel at ease with, can talk to about private matters, and can call on for help)?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

How may relatives do you have that you feel close to?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

With how many members of your family (parents, grandparents, siblings, aunts, uncles, cousins, etc.) do you live?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

Except for the ones you live with, with how many members of your family do you maintain contact (visiting, calling, or writing to them at least *once a month*)?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

Now picture a scale from "1 to 10," where "10" stands for someone who has strong ties to his or her local community and would strongly prefer to continue living there, while "1" stands for someone without any ties to the local community and would not be sorry to move away. Where would you place yourself on that scale?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

Picture a scale from "1 to 10," where "10" stands for someone who is very similar to each other in his or her local community, while "1" stands for someone without any homogeneity with others. Where would you place yourself on that scale?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

Picture a scale from "1 to 10," where "10" stands for a local community which is very traditional and common, while "1" stands for a local community which is very unusual and peculiar. Where would you place your main community on that scale?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

How many of people could you approach if you needed financial help or material support?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

How many of people could you approach if you needed emotional or psychological support?

Please circle one: 0 1 2 3 4 5 6 7 8 9 10 or more

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